

Appl. No.: 10/084,313
Amdt. dated 02/24/2005
Reply to Office Action of 11/30/2004

REMARKS/ARGUMENTS

Applicants appreciate the interview conducted with the Examiner on February 21, 2005. Applicants also appreciate the indication that Claims 2-4, 16-18, 30, 31, 33, and 36, 37, 39, and 40 would be allowable if rewritten in independent form. However, please clarify the status of Claim 38 as paragraph 5 of the Official Action rejects Claim 38 while paragraph 6 indicates that Claim 38 is allowable. The Official Action rejects Claims 1, 5, 7-15, 19, 20-28 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,571,171 to Pauly in view of U.S. Patent No. 6,163,744 to Onken et al. The Official Action rejects Claims 10-13 and 24-27 under 35 U.S.C. § 103(a) as being unpatentable over the Pauly '171 patent in view of the Onken '744 patent and further in view of U.S. Patent No. 5,657,231 to Nobe et al. The Official Action rejects Claims 14 and 28 under 35 U.S.C. § 103(a) as being unpatentable over the Pauly '171 patent in view of the Onken '744 patent and further in view of U.S. Patent No. 6,216,109 to Zweben et al. The Official Action rejects Claims 29, 32, 34-36 and 38 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,943,919 to Aslin in view of the Onken '744 patent.

As explained more fully below, independent Claims 1, 15, 29, and 35 have been amended to further patentably distinguish the cited references, taken either individually or in combination. In light of the foregoing amendments and the subsequent remarks, Applicants respectfully request reconsideration and allowance of the present application.

A. The Rejections of Claims 1, 5-15, and 19-28 under 35 U.S.C. § 103(a) are Overcome

The Official Action rejects independent Claims 1 and 15 over the combination of the Pauly '171 and Onken '744 patents. The Pauly '171 patent discloses an apparatus and method for inserting a waypoint into a preexisting flight plan, which includes selecting a waypoint on a Flight Management System (FMS) graphical display of a portion of the flight plan and automatically generating a proposed changed flight plan. See Abstract. Thus, once a pilot has selected waypoint 201 in the display of Figure 2, the pilot is given an option of inserting the waypoint 201 into the flight plan by clicking the insert button 204. The display of Figure 3 is

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then shown. The newly inserted waypoint 201 is shown to be inserted in first leg 106 and proposed new legs 302 and 304 are also shown. The FMS automatically generates the new legs such that the lines from the waypoint snap to the end points of whatever flight plan leg is nearest the cursor on the displayed map at any given time to thereby generate a new proposed flight plan. See Col. 2, line 61 to Col. 3, line 16. The pilot can then click an appropriate button to inform the FMS on whether to adjust the flight plan or not. See Col. 3, lines 16-29. Other persons associated with the planning of the flight, on or off the aircraft, other than the pilot are also capable of changing the flight plan. See Col. 3, lines 43-48.

The Onken '744 patent discloses a method for automatically correcting the flight of an aircraft, such as in a flight management system (FMS) used by a pilot during the flight, following a change in the flight-relevant parameters. Thus, the method permits the autonomous creation of flight plans as a reaction to, for example, air-traffic control instructions or incomplete pilot inputs. See Col. 1, lines 13-15, 33-36 and 60-63. The method includes supplying the flight plan, the flight status and environment-stipulated parameters present at the FMS to computer 1, where they are stored. The planning-relevant change inputs, such as all air-traffic control instructions, the auto-pilot inputs of the pilot and the pilot inputs for course, altitude and speed that are supplied to the FMS, are supplied to the mechanical systems of the aircraft and computer 1. Computer 1 verifies whether the change inputs necessitate a change in the flight plan or cause a discontinuity in the flight plan. Computer 1 requests navigation data as needed and flying performance data, if present, from the databases also available to the FMS.

The Onken '744 patent also describes that, in the event of a lateral discontinuity or deviation, computer 1 corrects the flight path laterally within the discontinuity with the aid of a suitable search-and-selection procedure. One search-and-selection procedure is an algorithm that searches for the most favorable flight path from a starting point to a destination point in that the flight path up to this point is expanded by new path elements. The elements are selected according to certain criteria, such as allowing segments of standard routes (not only direct connections between two path points) and/or planning the route to a fixed final approach point (not directly to the runway of the target airport), such that the route is planned as of the last reliably-known or estimatable point in the flight path. The elements are evaluated based upon

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the association of the respective path element with standard routes, the direction of the respective path element relative to the direct connection between start and destination, the length of the respective path element, in relation to the status of the on-board and/or ground navigation facilities, and/or the position of the respective path element relative to detected local weather disturbances. The entire path is additionally evaluated based on the path length, and foreseeable fuel consumption. The search-and-selection procedure is ended when the optimum path has been found, a sufficiently good path has been found, no better path was found after a certain number of attempts, all possible paths are tested, or a maximum number of paths have been evaluated. Afterward, or in the event of a purely vertical discontinuity or deviation, the flight-altitude profile is corrected or re-generated at least for the region of the discontinuity or, if needed, for the entire remaining flight plan. The corrected flight plan is supplied to the FMS. See Col. 2, line 52 to Col. 4, line 32.

In contrast to the disclosures of the Pauly '171 and Onken '744 patents, amended independent Claims 1 and 15 of the present application now recite determining a proposed pre-flight assignment for the aircraft. Thus, the proposed flight assignment is determined for an aircraft that has not yet been assigned to a particular route. As such, an aircraft is assigned to a particular route without modifying an existing route of the aircraft. In contrast, both the Pauly '171 and Onken '744 patents are directed to the modification of a route for a particular aircraft while the aircraft is in flight. For instance, the Pauly '171 patent discloses "inserting a waypoint into a preexisting flight plan . . . and automatically generating a proposed changed flight plan based upon inserting the waypoint into the nearest leg of the flight plan" (Abstract) (emphasis added). Similarly, the Onken '744 patent discloses "automatically correct[ing] an originally planned aircraft flight after flight-relevant parameters are changed" (Abstract) (emphasis added). As a result, Applicants submit that it is clear that neither the Pauly '171 nor Onken '744 patents teach or suggest determining a pre-flight assignment for an aircraft as recited in independent Claims 1 and 15 of the present application.

As to the other references cited by the Official Action with respect to independent Claims 1 and 15, the Nobe '231 patent discloses a route setting method and apparatus and an associated navigation system. The route setting method is used to obtain the shortest route from a starting

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position to a destination position (e.g., a car navigation system). Thus, the Nobe '231 patent is distinguishable from the pre-flight or tail assignment method and system of independent Claims 1 and 15. The Zweben '109 patent discloses iterative repair optimization with particular application to scheduling for integrated capacity and inventory planning. A system and method are disclosed for scheduling a complex activity that includes performance of many tasks, which requires many resources and adherence to state requirements of a multiplicity of attributes. Therefore, the Zweben '109 patent does not disclose determining a proposed pre-flight assignment, as recited by independent Claims 1 and 15.

Even if the references were combined, the combination would not teach or suggest any type of pre-flight assignment method or system as recited by amended independent Claims 1 and 15. Therefore, Applicants submit that the rejections of Claims 1, 5-15, and 19-28 under 35 U.S.C. § 103(a) are Overcome.

B. The Rejections of Claims 29, 32, 34, 35 and 38 under 35 U.S.C. § 103(a) are Overcome

Independent Claims 29 and 35 are rejected over the combination of the Aslin '919 and Onkin '744 patents. The Aslin '919 patent describes an onboard central maintenance computer system (CMCS) integrated into an aircraft system and a system for collecting and analyzing complete maintenance information. The CMCS collects, consolidates and reports line replaceable unit (LRU) fault data in order to aid flight crew and maintenance personnel in maintenance procedures. See Abstract. As shown in Figures 1 and 2, an indirect data bus 42 of the communications system 16 couples the CMC 12 to the integrated display system (IDS) 36 so that the CMC receives air data computer (ADC) fault data. The direct data bus 44 of the communications system 16 couples the CMC directly to non-built in test equipment (BITE) LRUs, such as the wing anti-ice LRU 48. See Col. 9, lines 47-63. The IDS 36 collects and processes fault data from computerized control systems 40 connected to the engine indicating and crew alerting system (EICAS) and the electronic flight instrument system (EFIS). The EICAS provides primary caution, warning and status condition display indications to the flight crew and the EFIS provides the primary navigation data display including attitude, altitude,

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course, etc. The IDS 36 displays information, such as primary flight, navigation, EICAS messages, etc. on an integrated display unit (IDU) 56. The dedicated displays of the IDU 56 are used by the IDS to annunciate system observations to the flight crew. The type of LRU fault data collected at the IDS is data indicative of situations that require crew awareness, i.e., flight deck annunciation, or that affect dispatchability. See Col. 10, line 65 to Col. 11, line 24. Fault data is detected while the aircraft is in flight. See Col. 11, lines 50-51. Most of the fault data collected via the direct data bus 44 is in an analog discrete format with signals indicative of characteristics such as switch position, valve position, voltage level, etc. The values of the analog discrete signals can be mapped to binary values and packed into digital words that are presented on the respective displays of the IDU 56. The analog discrete fault data is then analyzed by the CMC in the same manner as the digital fault data collected from the EICAS and the EFIS. See Col. 12, lines 11-49.

Independent Claims 29 and 35 have been amended to recite that the flight network represents a schedule for the aircraft. Thus, the flight network may show the possible flights for an aircraft that satisfies maintenance and operational constraints (See e.g., paragraph 29 and Figure 3 of the present application). In contrast, the Aslin '919 patent describes collecting and processing fault data from computerized control systems indicative of situations that require crew awareness, i.e., flight deck annunciation, or that affect dispatchability and mapping any analog discrete signals to binary values. Thus, the Aslin '919 patent does not teach generating a flight network from information that describes a possible flight of an aircraft, where the flight network represents an airline schedule for a particular aircraft (i.e., aircraft 1 to fly from DFW to CLT to CHI and aircraft 2 to fly from DFW to LAW to DFW). The Aslin '919 patent is primarily concerned with aiding flight crew and maintenance personnel in maintenance procedures by isolating faults to determine particular components that need repaired or replaced. As such, the Aslin '919 patent discloses the collection of fault data for maintenance purposes but does not generate a flight network, as defined in the present application.

In addition, the Onken '744 patent automatically creates revised flight plans to supply to the FMS, but the Onken '744 patent does not disclose generating the revised flight plan by generating a flight network from information that describes a possible flight of an aircraft, where

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the flight network represents a flight schedule for the aircraft. Although the Onken '744 patent may create the revised flight plan by using a search-and-selection procedure to search for the most favorable flight path from a starting point to a destination point by expanding the flight path by new path elements that are selected according to certain criteria, such as allowing segments of standard routes (not only direct connections between two path points) and/or planning the route to a fixed final approach point (not directly to the runway of the target airport), the Onken '744 patent does not generate the revised flight plan by generating a flight network that represents a schedule for the aircraft, as recited by independent Claims 29 and 35.

The remaining references, including the Pauly '171 patent, the Nobe '231 patent, and Zweben '109 patent, also do not teach or suggest generating a flight network, where the flight network represents a schedule for the aircraft. Therefore, Applicants submit that none of the cited references, taken either individually or in combination, teach or suggest the method or system of Claims 29, 32, 34, 35 and 38.

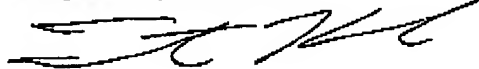
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CONCLUSION

In view of the amendments and the remarks presented above, it is respectfully submitted that all of the present claims of the present application are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicants' undersigned attorney to resolve any remaining issues in order to expedite examination of the present application.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

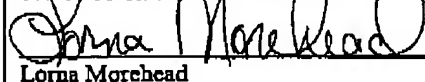


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Date

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